



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/840,229 | 05/07/2004 | Jang-keun Oh | 116511-00133 | 9670 |

27557 7590 10/28/2005

BLANK ROME LLP
600 NEW HAMPSHIRE AVENUE, N.W.
WASHINGTON, DC 20037

| |
|----------|
| EXAMINER |
|----------|

HOPKINS, ROBERT A

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

1724

DATE MAILED: 10/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/840,229

Applicant(s)

OH, JANG-KEUN

Examiner

Robert A. Hopkins

Art Unit

1724

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 8, 9, 11, 15 and 16 is/are rejected.
- 7) ☒ Claim(s) 4-7, 10 and 12-14 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3,8,9,11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bair et al(6428589) taken together with Davenport et al(2553175).

Bair et al teaches a cyclone separating apparatus comprising a first cyclone(70) separating dust from dust laden air, a second cyclone(100) centrifugally separating fine dust particle from air which is separated at the first cyclone, and a dust collecting unit(20) detachably connected to the first and second cyclones, and separately collects large dust particles separated at the first cyclone(chamber 44) and fine dust particles separated at the second cyclone(chamber 42). Bair et al is silent as to a plurality of second cyclones centrifugally separating fine dust particles from air. Davenport et al(2553175) teaches a cyclone separating apparatus including a first cyclone(41) and a plurality of second cyclones(35), wherein the dust separated from the first cyclone and plurality of second cyclones are collected in separate hopper sections(18,19). It would have been obvious to someone of ordinary skill in the art at the time of the invention to provide a plurality of second cyclones for the single second cyclone of Bair et al in order to improve the separation efficiency by providing a plurality of cyclones instead of a single cyclone.

Bair et al further teaches a first dust receptacle for collecting dust separated at the first cyclone, and a second dust receptacle for collecting dust separated at the second cyclone. Bair et al further teaches wherein the first and second dust receptacles include a cylindrical shape. Bair et al further teaches wherein the first cyclone comprises a first chamber centrifugally separating dust-laden air, a first inlet(80) formed at the first chamber to draw in the dust laden air, and a first outlet(124) formed at the first chamber to discharge air. Davenport et al further teaches wherein the respective second cyclones comprise a second chamber centrifugally separating air which is first separated at the first cyclone, a second inlet formed at the second chamber to draw in air which is discharged from the first cyclone, and a second outlet formed at the second chamber to discharge dust separated air. Bair et al further teaches wherein the cyclone separating apparatus further comprises an inflow and outflow cover formed at a top of the first and second cyclones , and fluidically connects the first and second cyclones, and a cyclone cover formed over the inflow and outflow cover.

Claims 15¹⁶ are rejected under 35 U.S.C. 103(a) as being unpatentable over Bair et al(6428589) taken together with Davenport et al(2553175).

Bair et al teaches a vacuum cleaner comprising a cleaner body(12) drawing in dust laden air and generating a suction force, a suction brush(within nozzle base 11) fluidly connected to the cleaner body to draw in dust from a cleaning surface using the suction force, and a cyclone separating apparatus formed in the cleaner body, wherein the cyclone separating apparatus comprises a first cyclone separating dust from dust

Art Unit: 1724

laden air, a second cyclone(100) centrifugally separating fine dust particle from air which is separated at the first cyclone, and a dust collecting unit(20) detachably connected to the first and second cyclones, and separately collects large dust particles separated at the first cyclone(chamber 44) and fine dust particles separated at the second cyclone(chamber 42). Bair et al is silent as to a plurality of second cyclones centrifugally separating fine dust particles from air. Davenport et al(2553175) teaches a cyclone separating apparatus including a first cyclone(41) and a plurality of second cyclones(35), wherein the dust separated from the first cyclone and plurality of second cyclones are collected in separate hopper sections(18,19). It would have been obvious to someone of ordinary skill in the art at the time of the invention to provide a plurality of second cyclones for the single second cyclone of Bair et al in order to improve the separation efficiency by providing a plurality of cyclones instead of a single cyclone.

Bair et al further teaches a first dust receptacle for collecting dust separated at the first cyclone, and a second dust receptacle for collecting dust separated at the second cyclone.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Conrad et al(6334234) discloses a cyclone separating apparatus including a combination first cyclone and dust collecting unit(30) which is removable from a vacuum cleaner, and a plurality of second cyclones(62) for separating dust particles from air separated at the first cyclone.

Allowable Subject Matter

Claims 4-7,10,12-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 4 recites "wherein the first dust receptacle is disposed inside the second dust receptacle, and is integrally formed therewith". Bair et al and Davenport et al both teach the first dust receptacle located outside the second dust receptacle. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide wherein the first dust receptacle is disposed inside the second dust receptacle, and is integrally formed therewith because neither Bair et al nor Davenport et al suggest such a modification. Claims 5-7 depend on claim 4 and hence would also be allowable upon incorporation of claims 4,3, and 2 into claim 1.

Claim 10 recites "wherein the first chamber is formed in a cylindrical shape, and the second chamber includes a predetermined part of one end of a truncated conical shape". Bair et al and Davenport et al teach a second chamber formed in a cylindrical shape. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide wherein the first chamber is formed in a cylindrical shape, and the second chamber includes a predetermined part of one end of a truncated conical shape because neither Bair et al nor Davenport et al suggest such a modification.

Claim 12 recites "wherein the cyclone cover includes a cone shape which opens upwards and downwards". Bair et al and Davenport et al teach a cyclone cover which is

Art Unit: 1724

flat. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide wherein the cyclone cover includes a cone shape which opens upwards and downwards because neither Bair et al nor Davenport et al suggest such a modification. Claims 13 and 14 depend on claim 12 and hence would also be allowable upon incorporation of claims 11,3, and 2 into claim 1.


Art Unit: 1724

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert A. Hopkins whose telephone number is 571-272-1159. The examiner can normally be reached on Monday-Friday, 7am-4pm, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Rah
October 26, 2005


ROBERT A. HOPKINS
PRIMARY EXAMINER
A.U. 1724